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(54) Title: **BIO-ELECTROCHEMICAL PROCESS FOR PRODUCING HYDROGEN**

(57) Abstract: A process for producing hydrogen from bio-oxidisable material is disclosed herein. The process comprises the steps of - introducing the bio-oxidisable material into a reactor provided with an anode and a cathode optionally separated by a cation exchange membrane and containing anodophilic bacteria in an aqueous medium; - applying a potential between the anode and cathode 0.05 and 1.5 volt, while maintaining a pH of between 3 and 9 in the aqueous medium; - collecting hydrogen gas at the cathode. The hydrogen production process can be intermittently switched to an electric power generation stage (biofuel cell) by adding oxygen to the cathode and separating the anode and cathode spaces by means of a cation exchange membrane.